Frankly Speaking

In One Year

DECEMBER 7, 1942, — first anniversary of our entry into a devastating conflict. It is not an anniversary which merits celebration as it carries the reminders of death, starvation, despotism and the upheaval of our personal habits.

But it is also an anniversary for the traffic engineer who acknowledges a year of experience in new fields wherein the scope of his activities has been enormously enlarged. He has concentrated on the problems of staggered hours, share-the-ride, conservation of resources, mass evacuation in the event of an attack, civilian defense, facilitation of mass transportation, blackouts, dimout, substitute materials and many other pressing problems.

In the period of this one year, many lives have been saved in highway accidents as compared with the previous year. Reduced volumes of traffic, a mandatory reduction in the speed limit and certain other factors have decreased our horrible highway slaughter.

Those who were saved from the clutches of the Grim Reaper are now undoubtedly helping to win the war by serving in the armed services or by working in war industries and who otherwise would have been names on tombstones.

Frankly, this heartening decrease in fatalities is not all attributable to our engineering efforts, and we cannot accept full credit for accomplishing this feat. Much remains to be done to save precious lives.

So our task still lies before us. The rocks on which the traffic engineering profession was built,—the application of signs, signals and markings and the establishment of a sound safety program,—still constitute the foundation of traffic engineering. It, therefore, behooves us to look to our signs and note if they are well kept. Are they fully legible? Are they used only where necessary? Is the metal thoroughly protected with paint?

To expedite the movement of essential traffic our signals should be timed carefully. We have read and talked about this but have we actually made the physical changes? Have unnecessary signals been removed? Is the maintenance thorough?

In what condition are our center lines, lane lines and crosswalks? Did they get the repainting that we had proposed this Fall?

With so many new activities on hand, are we still carrying that safety program onward to help save lives?

Let us remember our obligations and our stepping stones to success. Make our slogan LIVE FOR VICTORY!

Ray. F. Riegelmeier

Advertising Manager, Traffic Engineering

VOLUME XIII DECEMBER, 1942 NUMBER 3

THE SELECTION OF MILITARY TRANSPORT, AND EVACUATION ROUTES

By CAPTAIN ROBERT S. HOLMES

THE selection and marking of Military, Transport and Evacuation routes is highly important to Military Police because of their responsibility to keep traffic moving safely and efficiently over these routes. In the Theater of Operations, the Military Police are responsible for the movement of troops toward the front lines and the maintenance of supply lines to both front and rear. In the Zone of Interior, the Military Police are charged with the internal security of this country, including the regulation and control of traffic, when and if needed.

Though the Military have the responsibility of supervision of selected military routes in the Zone of Interior, it is essential that they maintain close contact with civil traffic engineers and enforcement authorities and cooperate to the fullest extent in the establishment and execution of a sound traffic plan. There is no need to point out that civilian authorities are much more familiar with local conditions than the Military. On the other hand, the Military are more familiar with their own specific requirements for movement and the means and methods of motor march technique. The two agencies, therefore, must work in close liaison in order to keep traffic moving safely over selected Military, Transport, and Evacuation routes. This coordination is being maintained by the War Department at the present time with the various State Highway Traffic Advisory Committees. The Military to date has received excellent cooperation from these committees established in every state.

Some of you may be familiar with the Military routes selected for the District of Columbia, in which the secondary routes bypassing the main sections of the city are now in use as routes for Military movements. On the other hand, in the Greater New York area, a system of routes has been selected in which the Military routes are the primary roads within the area; the civilian traffic being shunted to secondary roads when the need arises. Similar plans are in effect in other municipalities throughout the country. The rural network of roads designated as military routes was selected by the War Department some time ago, most of which you are familiar with. These rural routes consist of most of the major network of federal highways and primary state roads.

In the selection of routes in the Theater of Operations it is essential to select "*alternate*" routes for every "main" route utilized. A similar practice in the selection of Military and Transport routes in this country would be highly desirable. A system such as that in use in the Greater New York area whereby the primary roads are selected, and one like in Washington, D. C., where secondary roads are selected would be the most advantageous combination. Two systems of routing would then be in operation. The secondary routes could be used until such time as invasion may be imminent, at which time the primary system will take precedence. The primary route would then be designated as the "Main Supply Route" with alternate routing for other troops and supplies moving toward the danger area.

It is, of course, assumed that if an invasion actually takes place, the enemy will attempt to knock out by aerial bombing the major highways leading to the point of invasion. These

bombing raids would concentrate on roads which are specifically used by military vehicles. However, this can be offset by proper march technique, movement under blackouts, etc., as directed by the War Department. It is not necessary to consider routing to avoid bridges that may be bombed, as the enemy will not try to destroy facilities that may enhance their attempts to get from isolated landing points to the mainland.

Another primary consideration to be incorporated in the selection of military routes is the existing concentration of troops. Routes must necessarily lead from these concentration areas into the main arteries. No special consideration is deemed necessary for routing near vital war industries unless they can be bypassed without seriously hampering military traffic. Under normal conditions the interference with traffic moving to and from these industries can be controlled by proper schedule. If invasion is imminent, then the Military will naturally take precedence over any other movement. Proper camouflage can be effected around these industries to disguise them if military movements proceeding in their immediate vicinity are observed by the enemy. It is important to remember that until an invasion is imminent, interference with local traffic must be considered, but when and if it becomes necessary to defend our shores, Military will take precedence over any and all other types of traffic. The primary and secondary systems of routing will then be used; such routing to be established according to local conditions.

Up to this point, we have dealt specifically with Military and Transport routing. The other important routing selection under emergency conditions will be the roadnet used for the Evacuation of civilian populations. Such evacuation, when necessary, is entirely a military responsibility, but the military authorities cannot cope with the situation unless they have the complete cooperation of the civilian authorities. A sound plan, approved by both agencies, must be prepared and ready for immediate action.

Evacuation is placed in two major categories; voluntary and forced. An example of voluntary evacuation is that effected on the west coast when enemy aliens were moved into the interior. This evacuation was purely voluntary and without threat if imminent invasion. It was successfully conducted with the complete cooperation of both civilian and military authorities. The Military Police controlled this movement over the entire route, and there was no serious delay of normal traffic during the movement. Forced evacuation becomes a more complicated procedure because of the very nature of the movement. Troops and supplies are hurrying to the front and civilians become alarmed and begin making individual attempts to move to the rear. The resulting confusion is obvious unless a very rigid plan has been effected and properly carried out. Such proposed plans are now in effect all over this country; established by the civilian authorities without prompting by the War Department. These plans include commercial fleets, busses and trains, if available. In some instances it may be possible to divert military vehicles for evacuation needs.

The routing selected for evacuation may be the same primary and secondary roadnet already established for Military and Transport use, providing such evacuation is of a voluntary nature. If evacuation is forced, then it becomes necessary to designate other roads that do not materially conflict or interfere with the major routes already selected, or in use. Consideration must necessarily be given within the municipality or on the outskirts

thereof for assembly areas where designated districts of the municipality have been ordered to report. Consideration must be given in the selection of these assembly areas to the proper camouflage, and prevention of traffic jams, so that enemy aerial observers will not become aware of concentration and take means to destroy the vehicles.

Along the rural routes the civilian and military authorities must coordinate their activities in selecting halt sites, overnight bivouac areas, arrangements for meals, refueling, etc. City and state highway and traffic engineers can be of invaluable service in assisting in these necessary arrangements. If such coordination is effected all evacuation movements can be made orderly, and can be properly controlled without fear of panic or dispersion of individuals. This has already been proven by the orderly evacuation of the Japanese from the west coast.

The important thing to be remembered in the selection of evacuation routes is that the Military and Transport routes must be kept free for military movement. No better example can be cited than the situation in France in 1940 when both military and civilians attempted to utilize the same route with the resultant congestion, confusion and destruction.

In closing, I would like to point out that the Military Police are prepared to cooperate and collaborate to the fullest extent with the civilian authorities. In their training they are instructed that they can expect full and complete cooperation from civilian traffic engineers and enforcement authorities. The two agencies, hand in glove, will go a long way toward facilitating the successful conclusion of the war.

Address delivered by Robert S. Holmes, Captain, Corps of Military Police, The Provost Marshal General's School, Fort Custer, Michigan, at the Annual Convention of the Institute of Traffic Engineers, Chicago, Illinois, October 26, 1942.

CITY TRANSPORTATION OUTLOOK

By GUY A. RICHARDSON

THE Office of Defense Transportation did not drop the bombs on Pearl Harbor but that attack cut off more than 90 per cent of our supply of crude rubber. These things have happened and we must face them. It is certain that our stock of crude rubber is dwindling rapidly.

Last February 4, I outlined what Washington was thinking and suggested that each transit representative go back to his property and begin to get his house in order. Our treatment of the problem at that time was largely "conversational," as the beginnings of any constructive enterprise must be. But, we must point out with reluctance that some of the transit properties with whom this Office has had to deal are still in the "conversational" stage. Because of this it is in order that we have at this time a specific accounting of our stewardship and discussion of results accomplished under the cooperative basis on which this Office has chosen to function.

The Division of Local Transport issued on April 17, 1942, a 12-point Statement of Policy. We chose as our medium for carrying out these policies the state commissions and local regulatory authorities having primary jurisdiction over transit operators. We feel that this plan is working and that it will function with increased effectiveness as the regulatory bodies and the operators embrace more fully the

import of the shortages of critical materials. This plan is to be preferred to more direct types of action.

The public carriers of persons could not, either with present or vastly enhanced facilities, undertake the load which would be imposed upon them if the private automobile should largely disappear as a means of transportation. A considerable portion of our effort has been devoted to the development of plans for stimulating group riding in private automobiles. This is becoming effective among the employees of plants in outlying locations remote from established transit services. For the duration of the war the private automobile must be looked upon as a necessary adjunct of the domestic transportation scheme. Those in the transit industry who still may be guided in their thinking by the purely "business" motive must recognize the physical impossibility of their carrying the entire load and the war necessity of having every vehicle operate to its fullest capacity in the most effective manner.

Simultaneously with efforts to stimulate the continued and efficient utilization of the automobile as a local transport tool, this office began a campaign to increase the capacity of existing mass-transportation facilities through the universal introduction of staggered working hours.

The staggering of working hours is the greatest potential source from which added passenger-carrying capacity can be created without the need for additional vehicles or manpower. It is difficult to convince those agencies which control allotment of materials that additional transit vehicles are needed when part of those now owned by transit operators are standing idle for the greater portion of the working day. It is equally difficult to convince those charged with effecting the provident use of manpower under the Selective Service Act that men should be diverted to drive additional transportation vehicles, when it is patently clear that our present manpower operating our present vehicles can handle many thousands of added passengers each day by operating more trips under a staggered-hours program. We can understand the natural reluctance to change habits on the part of the average citizen, but it is difficult for us to understand the hesitancy of some of the professional transit operators to assume leadership in the planning and application of staggered-hours programs for their respective communities. We are fast coming to the conclusion that some of these properties need to be forced into constructive thinking about staggered hours by withholding the privilege of acquiring additional transit vehicles until such time as they can show conclusively that they have realized in practice the full benefits of a staggered-hours plan.

In line with the policy of accomplishing results through advice and direction and through guided voluntary effort, the Office of Defense Transportation requested the Highway Traffic Advisory Committee of the War Department to undertake the administration of the group-riding and staggered-hours programs. The work of some of these committees and administrators has passed the formative stage and definite results are being realized. In other localities progress in these directions leaves much to be desired. What this office most deplores is the attitude expressed by some transit companies that the responsibility for carrying out these programs rests entirely with the local administrator and his committees.

The third general order, No. ODT-20, effective September 1, regulates the services of taxicabs. It is expected that sufficient rubber will be provided for legitimate taxicab operators who comply with the terms of the general

order. Cruising will be eliminated, and the load factor of the vehicle will be vastly increased.

Properties operating in cities of over 200,000 population have restored approximately 1,400 vehicles to active service which were in or definitely destined for retirement. In addition, passenger-carrying space to the equivalent of 3,700 transit vehicles of various sizes and types has been created.

Men and women must get to and from work. Many properties are still trying to meet their situations through the acquisition of additional vehicles instead of "buckling down" to making fuller use of the equipment which they now have. These examples of seeking the easy way out are detrimental to the over-all effort and add to the burden in securing approval from the governmental agencies responsible for authorizing the diversion of critical materials.

This office recommended the construction of 800 street-cars, 600 trolley coaches, 12,000 city-type buses, and 2,000 intercity buses for 1942. Some apprehension was felt in June when it appeared that further construction of buses would be discontinued after July 18. The authorization of July 15, however, provided for the completion of 3,600 additional buses, bringing the total equipment in prospect for the year to 350 street-cars, 400 trolley coaches, and 9,000 buses. These 3,600 additional buses were authorized for the use of the transit industry under the express limitation that the Office of Defense Transportation should prescribe conditions for their distribution and utilization in such manner as to form a national pool of integral buses for transfer at any time to points of greatest transportation need.

Not the least of the activities of the staff have been encouragement and actual development of expedients in the way of unorthodox transportation vehicles which might be employed as alternatives to equipment of the conventional types requiring large quantities of critical materials for their construction. The first step in this direction was the conception, development, and actual building within a period of 30 days of a large mass-carrying trailer, the construction of which required a minimum of critical material and the use of truck tires of a relatively small size. This vehicle, unusual as it may appear to those accustomed to dealing with the more refined tools of peacetime transportation, has set a standard in efficiency from the standpoint of the number of passenger miles which can be obtained per pound of crude rubber. While quantity production of this type of vehicle has not yet been undertaken, it has served as a stimulus to the development of many alternative vehicle forms, among which are the converted auto haul-away and specially developed trailers and semi-trailers of various sizes and types, including smaller types for towage behind automobiles. The division has also encouraged the development of what are known as "blown-up" sedans. We have been concerned to a considerable extent by the hesitancy of transit managements to consider vehicles of these types for use in their proper fields of application. From this standpoint many managements are still thinking and planning in terms of peacetime operations and are inclined to look with disdain upon these expediences as well as upon the acquisition of second-hand equipment and the use of school buses already built and operating in the general area which they serve. We are convinced that before the last period is placed after the final sentence in the history of this global war, transit operators will be glad to get any sort of vehicle which will roll on wheels with

dependability. Our records show all too frequently that operators have failed to acquire second-hand vehicles readily available to them because they did not meet with what these operators considered to be their peacetime vehicle standards in appointment and convenience. Similarly we have been told too many times that school buses in the surrounding area cannot be utilized by the established transit operator because the school hours coincide with the hours of his industrial haul. Here is an opportunity for the application of staggered school and working hours.

The staggering of working hours and the spreading of loads is still the most fruitful source of added carrying capacity. The elimination of duplications of service, the employment of alternative forms of vehicles, and the continued encouragement of the swap-ride principle are essential for lessening wasteful dissipation of rubber. In setting up procedures to insure more effective use of the transportation facilities now at our disposal, the Division of Local Transport contemplates certain additional measures. There will be further control of the delivery of authorized equipment. The procedures which now apply to the release for delivery of integral buses will be extended to the adult bus body and the school bus body. We are presently contemplating the establishment of a series of regional offices in order to place trained transportation specialists in closer proximity to the field of operations. We have tried strenuously to avoid this latter move, but the lack of voluntary effort on the part of many properties makes it necessary for us to establish a system of closer supervision of their activities. It is hoped that the performance of the individual properties from this point forward will be such that the organization of the Division of Local Transport will not have to be expanded into districts and localities. These steps will, however, be forthcoming unless the results which we know can be produced from voluntary effort are manifested.

Condensed from an article by Guy A. Richardson, Director, Division of Local Transport, ODT, Washington, D. C., published in *The American City* Magazine, October, 1942.

THE CITY GOVERNMENT'S TRANSPORTATION RESPONSIBILITY

By VIRDEN A. RITTGERS

TRANSPORTATION is one of the greatest governmental functions of American cities. It is at the same time, in many major respects, the poorest managed function. There is a very understandable reason. It is that there is no managing head—not even a coordinating head—in charge of transportation. The parts of this huge enterprise are scattered among several other city departments. The slow moving processes of Government have not yet changed custom to match motor transport development. Were these scattered functions united, the true magnitude of the urban transportation job would be more easily appreciated.

Today, construction and broad planning problems in transportation take a back seat. Not so with the operating end of the job. It is going through a crisis which will stand out in the history of our country.

Unprecedented Government control measures suddenly become imperative to conserve our whole transportation system. Conservation in this instance means two things, broadly speaking. They are:

(1) Doing away with non-essential and curtailing less essential transportation.
(2) Efficient operation of the remaining, essential transportation.

One of the first steps, in coping with this emergency situation the country over, has been the *appointment* of a Transportation Administrator or Director to coordinate and direct activities involving both private and public transportation. (Can one imagine a huge industrial concern, when one of its major departments was faced with an emergency, having to appoint a department manager for the duration of that emergency? Hardly.)

Many things can be done to help conserve a public transportation system. Some of these are major items. Many are relatively minor, but they combine, as smaller things usually do, to become important. Some mean limiting service — stripping it down towards bare essentials,—an *improvement* if it helps *maintain* transportation.

Much has been written recently about club riding and staggered hours programs. Progress has been slow, yet encouraging where leadership was effective. These sensible plans have to buck firmly entrenched habit and custom.

It is the purpose of this article mainly to discuss some of the things other than club riding and staggered hours for improving urban transportation, *now*.

The people who run transit systems generally know their business. This does not mean that the transit operations are 100% efficient or that local officials cannot work cooperatively toward improvements. The transit people are serving the public—the same public to which public officials have sometimes catered. And, if the patrons want to pay for certain services, they are apt to get them. At least, that's the way it was until recently.

First, consider routing improvements. Because many people *prefer* to ride buses, bus lines frequently are found routed along rail lines. These bus lines should be eliminated, rerouted, or curtailed to the extent that the rail lines can take over the load. This brings up the point that, while attention has been largely focused on war activity centers where *all* transit facilities are in full use and overloaded, there are many, many communities where this condition is not so acute. Yet, transportation must be conserved in these other cities, too.

A check-up is apt to reveal "poor" lines in spite of high system passenger loadings. These routes may have been established to satisfy small groups or at one time, perhaps they were actually needed. They are difficult to take out—just as it's difficult to take away anybody's "pet" idea.

Frequently, time-wasting circuitous routings can be straightened out. Four sharp turns can waste as much as one hour's time on one line in a day's operation. A route may be moved one block and avoid the delays of a local business center. There is one case of a city of 100,000 population having nine motor bus lines *all* of which were routed both ways through the entire central business district on the one principal retail business street. The police were worrying about peak hour traffic congestion. No wonder!

Some routing changes may appear obvious. Others may creep up and go unnoticed for a long time.

"Spaced" transit stops mean increased operating efficiency. Principal advantages include (1) Reduced tire and mechanical wear; (2) Savings in fuel; (3) Reduction of interference with other traffic; (4) Increased capacity (if needed) through reduced running time. These gains are made

at the expense of only slight extra walking distances—much less than may be carelessly assumed. If stops are spaced, for instance, 3 blocks apart, the average *extra* distance for patrons is only 2/3 block.

Factors to consider in locating spaced stops, include (1) Transfer locations; (2) Points where essential traffic control forces transit vehicles to come to a stop regularly or frequently; (3) Relative extent of use of various stop locations by patrons; (4) Locations of turns in the route; (5) Physical and traffic conditions of the street at various points; (6) Block lengths. Consideration of these and perhaps other factors indicates the impracticability of arbitrarily skipping alternate or second and third corners, as a general plan.

Actually, the reduction in stopping and starting operations of the transit vehicle is apt to be much less than popularly supposed. The reduction of the number of transit stop locations on a line from 100 down to 40 does not mean an average reduction of 60 stopping and starting operations. It would mean, on an average, a reduction in actual stopping per trip of 60% *of the average, normal percent usage* of the 100 stop locations. This percent usage may be much lower than had been taken for granted, even where heavy loads are involved. Checks on transit runs in Richmond, showed averages of 50% to 60% usage of stops, per trip—less than anybody had assumed. Other studies revealed an average of 10 seconds net time loss (deceleration plus acceleration losses, only) by motor buses, per stop made. In low speed sections, the amount is near 7 seconds. In faster running areas, it is 12 and 13 seconds. These losses were slightly less for streetcars because they operate at slightly lower running speeds. On this basis then, take for example a transit vehicle making a round trip in 60 minutes on a route having 100 stop locations, 60 of which are used. If 60% of the stop locations are eliminated, approximately 36 stops and starts at 10 seconds each will be saved, or 6 minutes per trip. A 10% reduction in running time means 11% more trips and that could result in 100 vehicles hauling in the neighborhood of 3,000 more persons during 4 peak hours.

The installation of "cut-back" operation helps fit capacity to load along the route. However, adoption of this sensible expedient has been neglected and put off many times because outlying patrons *desired* just as frequent service as patrons closer in *needed*. The public was willing to pay for this kind of service and they got it.

Transit loading facilities must receive more attention today, as mass carriers haul more millions monthly. This item has been sadly neglected in many communities—well handled in a few. Traffic engineers have designed some excellent type loading islands and zones. Their adoption has been entirely too limited.

Where extensive construction of loading islands cannot now be carried out, painted zones help some. Generous use of traffic buttons made of concrete or even wood provided a fair degree of protection. The combination of heavy paint lines, closely spaced buttons and effective marker signs provide a zone appreciated by transit riders.

Installation of new control equipment is not generally possible now, because of rationed materials. But, too many "sins" are hiding behind the "skirts" of *priorities*—a wonderful excuse for the "do nothings." A thoroughly overhauled control system will in most cases yield much valuable equipment to be used for actual needs where new problems have arisen.

Blackouts further complicate transport operations and must be consid-

ered in many aspects of control work. The floundering has been terrific as local agencies strived to provide proper control of vehicle headlighting and traffic signal lights for blackouts. The time and money wasted on ill-advised, crackpot ideas would add up to a significant figure. It now appears that officials are gradually swinging around to voltage control for signal operation as originally recommended by many traffic engineers. Local officials everywhere should obtain copies of all of the excellent and thorough War Department Specifications pertaining to signal, vehicle and other lighting control for blackouts. Unfortunately, critical materials have not yet been allocated to permit general civilian use of officially approved vehicle headlighting equipment for blackouts.

Urban parking control has been generally haphazard, although real progress has been made in some cities. Now is the time to get rid of bad parking practices resulting in impeded movement, view obstruction, restriction of bus zones to half their proper size, blocked crosswalks, etc. The reduction in traffic density has already resulted in the unwise policy of hasty, general relaxing of time limits and prohibited parking areas. The *first step* in meeting the reduction in parking space demands should be to eliminate parking from those places where it never should have been permitted. Take for example, parking meters installed up to crosswalks at intersections, where parking is contrary to the city's own ordinances.

The evil policy of "forgetting" about accidents has made its sinister appearance in some quarters.

In addition to the usual human casualty factor there is a new one caused by the war. Smashed automobiles are not being replaced and wrecked trucks and transit vehicles mean use of more vital industrial facilities if they are to be replaced. Even minor accidents to transit vehicles, which are increasing as transit traffic increases, mean schedule interruptions, more time in the repair shops and reduced transit capacity. How can we relax our effort to protect motor transportation when greater numbers of our army of war workers become casualties on our highways than in their great plants.

Many police organizations are bearing down extra hard nowadays as a contribution to the Nation's all-out fight. Nevertheless, many a traffic enforcement policy should be *squarely reversed*. Our complex transportation system requires many rules and regulations. The system cannot operate efficiently if the public, burdened with many added worries, is forgotten by the traffic police and allowed gradually to become more careless. Leadership should not, through confusion, permit the people to be misled into a feeling of false security on the streets and highways because traffic has fallen off.

The overhauling of traffic control systems should be city-wide. Additions or extensions of control and regulations should be generally limited to a strategic network of streets which are of immediate, primary importance. This street system should be officially designated, after collaboration with all interested departments and agencies, and attention should be focused on it continually. The network would include (1) Transit routes; (2) Important state and federal highway routes; (3) Routes important to the movement of war workers and war materials; (4) Military convoy routes; (5) Evacuation routes; (6) Selected local traffic arteries of current general importance; (7) Alternate and by-pass routes for the above.

Many municipal officials are doing a good job in coping with the urban transportation problem, and most of their good work will have post-war carry-over values. But, commendable

efforts do not mean that this gigantic problem is being handled as it should be. We were too far behind before we got started. As the difficulties gradually multiplied through the years, they were quite naturally assigned to various departments, and there the responsibilities for those problems have tended to remain.

When the war emergency came along, coordinating "department heads" had to be assigned to supervise the over-all transportation problem. The truth is, there was serious need for such coordinated management *before* the war. One of the very worthwhile by-products of this war will be the start that will have been made towards establishment of Urban Transportation Departments.

Condensed from an article by Virden A. Rittgers (Mem. I.T.E.), City Traffic Engineer, Richmond, Virginia, published in *The American City* Magazine, November, 1942.

ACCESS ROADS TO INDUSTRIAL PLANTS

By W. H. Harvie

THE term "access roads" is becoming the common and popular expression among highway engineers. Production is the key-note of our whole war effort and this great system of war production depends to a great extent upon the efficient movement of highway transport.

Congress has appropriated $150,000,000 for the construction and improvement of access roads to military and naval reservations; to defense industries and defense industry sites, and to sources of raw materials.

An access road to industrial plants is a road that furnished transportation to and from an industry that is essential to the national defense and war effort without an unreasonable delay.

Planning. In developing an access road program the following factors should be before us:

Number of employees.
Origin and destination of all vehicular traffic.
Number of shifts.
Number of passenger cars, trucks, and buses per shift. (Today the figure of 3 employees per passenger car seems reasonable.)
Present traffic count (Daily average and peak load) on the available highway facilities.
Permanency of the plant.
Other methods for handling traffic such as railroads, street cars or homes within walking distance.

After determining what the present facilities can handle plus the additional traffic imposed on the system and dividing by the assumed hourly rate we can easily determine the number of lanes required.

Design. The number of lanes necessary to and from the industrial plants will determine the feasibility of designing a modern free flow limited access highway.

The following factors must be considered in our road design:

Number of lanes required
Access limitations
Design speed
Service roads to take care of roadside business
Road separations
Road interchanges
Right of way requirements
Future expansion of the system
Stage construction

From this information we are able to furnish the War Department an estimate of cost with other factors showing the necessity for certification.

An abstract of a paper presented at the 28th Annual Highway Conference at the University of Michigan by William H. Harvie, Road Engineer, Michigan State Highway Department.

TRAFFIC SIGNALS IN WARTIME

By F. M. SPAUGH

ON MAY 21, the city of Hudson turned off its red and green traffic signals to save gasoline and tires. The test lasted just three hours. At the end of that time the chief of police ordered the signals returned after several children were nearly struck by automobiles at intersections guarded only by yellow "caution" lights.

Today, with wartime traffic creating serious congestion problems, the use of the familiar red-yellow-green lights is a matter of national necessity. It is most important that war workers, soldiers, sailors, and armament workers reach their destinations safely.

Traffic signals have proved again and again that they are essentially life savers. In the City of Schenectady the installation of traffic signals, plus a short but intense pedestrian campaign, resulted in the reduction of about 77 per cent of accidents. One year after the installation, Schenectady won the National Pedestrian Award.

In most cases the trouble undoubtedly lies in the fact that traffic control devices installed for peacetime traffic needs have not been readjusted to meet the needs of wartime transportation.

Streets and highways leading directly to war factories have for more than a year been carrying far heavier loads than they are equipped to carry safely. Adjustment of traffic-control devices on these overloaded streets will reduce the accident rates and reduce driving time to the destination.

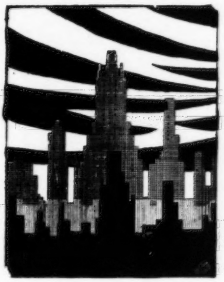
The adjustment of traffic signals to meet changing needs is a simple matter. If the problem street consists of a main heavily traveled traffic artery and a minor cross street having a relatively small number of cars, the efficiency of the signal can be increased materially by changing the percentage split of the timer so as to allow more time on the major street with correspondingly less on the minor street. The gain in getting additional cars on the main street through the intersections without stopping offsets the fact that the smaller number of cars on the cross street must wait an extra 10 or 20 seconds for the green light.

When readjusting traffic signals to meet wartime traffic needs the pedestrian must not be forgotten. This problem is now greater than ever before, since many more people are walking. Adequate time must be allowed for the man on foot to reach the other side of the street safely.

Many methods of signal control during blackouts have been tried since our entrance into the war. As a result, quantities of critical materials have been used without accomplishing the desired results. Typical of these are many of the masks with various openings and configurations on the front surfaces.

Another method now being studied, which appears to be most effective, is that of reducing the intensity of the signals by inserting a transformer or resistance in the circuit to the lamps. The best solution at the moment seems to be to insert this transformer into the circuit in conjunction with a manual switch. It is suggested, however, that no steps be taken until definite specifications concerning methods and areas in which they should be used are issued by civilian defense headquarters or by the military authorities.

Condensed from an article by F. M. Spaugh, General Electric Illuminating Laboratory, Schenectady, N. Y., published in *The American City* Magazine, October. 1942.



Stop, Look and Listen

SEASON'S GREETINGS TO OUR SUBSCRIBERS FROM THE EDITORS

STILL AVAILABLE

On the cover of the October issue of TRAFFIC ENGINEERING the name of the Western Cataphote Corporation was listed under the heading "No More For The Duration." Our Advertising Manager advises that although this Corporation has now over 90 percent of war work it can still supply its highway reflectors and delineators for "priority jobs."

EXPANDING RESPONSIBILITIES

Mr. J. W. A. Bollong (Mem. I.T.E.) Traffic Engineer, Seattle, Washington, has listed below war duties in addition to his peacetime pursuits of installing and maintaining 14,000 traffic signs, painting 130 miles of traffic lines, operating 260 traffic signals, taking traffic counts, compiling accident statistics, maintaining accident spot maps, enforcement maps, traffic records and correcting accident hazards:

His war duties are:

Laying out army, evacuation and emergency routes.
Installing and operating Seattle's entire air raid warning siren system.
Applying dimout and blackout regulations.
Advising the War Transportation Commission.
Supplying illuminated barricades and closing streets for army and navy.
Allocating space for army and navy officials for use of streets.
Handling all priorities for equipment for the above services.

Testimony of his success is contained in a letter to Mr. Bollong from the National Highway Traffic Advisory Committee to the War Department. In essence the letter states—"We are much impressed with the thoroughness of your report on staggered hours, share-the-ride and the like." Extra copies of this work have been requested.

TRAFFIC SIGNAL CONTROLLERS

By WILLIAM C. BRANDES

Standardization of traffic control devices has long been considered essential in the interest of public safety on the highways. Traffic engineers and others responsible for the installation of traffic control signals will be aided materially in future purchases of control equipment by the I.T.E. Standard Specification for Pre-Timed Fixed Cycle Traffic Signal Controllers. This code has been in process of preparation for the past three years by the Standards and Specifications Committee of the Institute.

Cooperation during the past year on the part of the Traffic Signalling Section of the National Electrical Manufacturers Association has produced a code, approved by the latter group, which is now ready for submission to the American Standards Association for adoption as a national standard.

The code referred to contains, in addition to purchase specifications, informative material in the nature of (1) control flexibilities obtainable; (2) various illustrative sequences of signal indications and (3) a complete list of terms and definitions including many of a general nature.

Naturally any standards being prepared today for immediate use must allow employment of substitute materials for those of limited supply. Such has been done in this code. However, no attempt has been made to name specific substitute materials. That problem will devolve upon the ingenuity of the manufacturer who has already proved he can meet this responsibility. If such so-called substitute materials prove their worth during the war they may maintain their positions following the emergency if that is in the public interest. At any rate I.T.E. specifications on control signal equipment are primarily functional so that choice of materials is given a wide latitude.

Contributed by Wm. C. Brandes (Mem. I.T.E.), Chairman of Standards and Specifications Committee, Institute of Traffic Engineers.

[Printed copies of this I.T.E. Specification will be distributed in the near future.]

REHOUSING TO RELIEVE STREET CONGESTION

Fred W. Fisch (Mem. I.T.E.) is on a three-month leave of absence from Schenectady as Director, Bureau of Traffic and City Planning. Member of the Technical Advisory Committee of the New York State War Transportation Committee and Co-Chairman of the city's War Transportation Committee to handle the technical phases of a local Defense Housing Program.

Mr. Fisch has long been interested in providing for essential housing and replanning substandard areas which when accomplished will provide much needed street and terminal improvements in the congested area of Schenectady.

SHORTAGES DENIED

Oklahoma City, Nov. 17.—(AP)—Frank Buttram, president of the Independent Petroleum Association of America, said today there was neither a rubber nor a gasoline shortage in the United States.

"A private study which has never been published but which was presented to the petroleum industry's war council shows that there was in existence in the U. S. on Dec. 7 about 800,000 tons of natural rubber," he said. "If a mere 200,000 tons was used in combination with reclaimed rubber it would provide enough recaps to keep every car in the U. S. running until 1946."

Providence *Journal*, Nov. 18, 1942.

I.T.E. MEMBERS IN ARMED FORCES

as of October 23, 1942

Note—This list is not presented as a complete list of all I.T.E. members in the armed forces but simply includes the names of those from whom we have heard direct. Please advise the Secretary of the Institute of any other members who are in the armed forces.

Andriacchi, Louis A., Pvt. (Assoc.), Co. E, 27th M. P. Bn., Fort Riley, Kansas.

Barton, George, Capt. (Member), Transportation Service, U. S. Army, now in England.

Branigan, Daniel A., Major (Assoc.), Constructing Quartermaster, Corps of Engineers, U. S. Army, Camp Grant, Ill.

Burrage, Robert H., Lt. Col. (Assoc.), Chief of Mobilization & Operation Sec., Office Chief of Engineers, Washington, D. C.

Clark, C. C., Lt. (Junior), now in Ireland.

Cyberski, Barney A. (Junior), Headquarters Co., 107th Qr'tr., Regiment, Traffic & Safety Div., now in Australia.

Deetz, Russell S. (Junior), 2nd Student Training Regiment, Co. 20, Ft. Benning, Ga.

Dibble, W. W., Lt. (Assoc.), Engr. Amp. Com., Camp Edwards, Mass.

Faustman, D. Jackson, 1st Lt. (Jun.), Corps of Engineers, U. S. Army, Engineer Board, Fort Belvoir, Va.

Gallagher, John F., Lt. U. S. N. (Assoc.), District Transportation Officer, 4th Naval District.

Galletly, Wellington O. (Assoc.), in Army.

Gilman, Roger H., Ensign U. S. N. (Jun.).

Gravelle, Gordon Karl, Lt. (Assoc.).

Havenner, Jos. E., Ensign U. S. N. (Jun.), overseas.

Hayton, Alexander A., Brigadier General, Australian Army (Affil.), last reported as a prisoner of war in Italy.

Hendrickson, Laurence E., Lt. (Jun.), 10th Signal Service Co., last reported at Fort William McKinley, Philippine Islands.

Holmes, Robert S., Capt. C. M. P. (Jun.), The P. M. G. School Center, Fort Oglethorpe, Ga.

Kamy, Harry D., Capt. (Jun.), Corps of Engineers, The Engineer Board, Fort Belvoir, Va.

Kreml, F. M., Capt. (Affil.), U. S. Army Office of Transportation, now in England.

Lewis, Taylor D., Capt. (Assoc.), 15th F. A. Observation Battalion, Fort Bragg, N. C.

Lutz, S. M., Jr., Lt. (Jun.), U. S. Army Air Corps, Jefferson Barracks, Mo.

Moyer, Robert S., Lt. (Jun.), U. S. Army.

Myers, Frank C., Lt. Col. (Assoc.), Base Maintenance Officer, U. S. Marine Corps, Marine Corps Base, San Diego, Calif.

Rader, Lloyd F., Lt. Commander (Affil.), Public Works Officer, U. S. Naval Station, New Orleans, La.

Ricker, Edmund R., Capt. (Jun.), Engineer Board, Fort Belvoir, Va.

Ristroph, Paul L., Capt. (Assoc.), Headquarters, Military District, Washington, D. C.

Royster, Robert F., 1st Lt. (Jun.), Engineering Board, Fort Belvoir, Va.

Schantz, George, 2nd Lt. (Jun.), Corps of Engineers, Asst. Area Engr., Chicago Aircraft Assembly Plant.

Stedman, Harry E., Lt. Col. (Member), 168th Infantry, 34th Division APG No. 34, c/o Postmaster, New York City, overseas.

Swain, Robert O., 1st Lt. (Assoc.), Engineer Board, Fort Belvoir, Va.

Taylor, Phillip E., Lt. (Assoc.), Traffic Control Section, Engineer Board, Fort Belvoir, Va.

Tildren, Charles J. (Member), Signal Corps, Camp Evans, Belmar, N. J.

Tipton, Laurence B., Capt. (Affil.), War Safety Training Supervisor, Washington, D. C.

Vey, Arnold H., Major (Member), Transportation Corps, U. S. Army.

Wetzel, Edward G., Capt. F. A. (Assoc.), Highway Transportation Division, Transportation Service, War Dept., Washington, D. C.

Yost, Light B., Lt. (Affil.), Transportation Branch, War Dept., General Staff, G-4 Division, Washington D. C.

RESULTS OF HIGHWAY-CAPACITY STUDIES

Mr. O. K. Normann at a recent Michigan Highway Conference reported, in essence, the following facts. Preliminary results of highway capacity studies conducted by the Public Roads Administration in cooperation with the highway planning survey organizations in several states were published in 1939 and have been used in the solution of numerous traffic-control and highway-design problems by the various state highway departments and other agencies. Data obtained prior to 1939 have been supplemented by more recent data and the analyses completed to determine theoretical, possible, and practical capacities for 2-, 3-, and 4-lane highways.

Since the results are based on data gathered prior to the present tire and gasoline rationing programs, they will be of maximum value upon a return to normal driving conditions. However, many of the principles developed are applicable to military traffic as well as the efficient movement of civilian traffic in the neighborhood of defense industries.

The maximum theoretical capacity of a single traffic lane is about 2,000 vehicles per hour, occurs at speeds above 30 miles per hour, and can be attained on 4-lane highways or on short sections of 2-lane roads.

The total possible capacity of a long section of 2-lane highway with good alinement, carrying few trucks, is about 2,000 vehicles per hour or one-half its theoretical capacity. A corresponding value for 3-lane, 2-directional highways is 3,600 vehicles per hour. The maximum possible capacity of a 4-lane highway is 8,000 vehicles per hour or 4,000 vehicles per hour for the 2 lanes used by traffic traveling in the one direction. When trucks constitute 17 percent of the traffic the possible capacity of a 2-lane highway is reduced by about 25 percent.

The practical working capacity of a highway is a relative value and depends upon local conditions as well as the width or number of lanes. The maximum practical working capacities for 2-, 3-, and 4-lane rural highways under normal conditions are 800, 1,400, and 2,800 vehicles per hour, respectively. However, the results presented are of sufficient scope to be of value in the determination of the practical capacity for any highway condition and in the solution of numerous traffic control and design problems.

Public Roads, May 1942

COURT ASSAILS ARMY CONTROL

Portland, Ore., Nov. 17—(AP)—The authority of Lieut. Gen. John L. Dewitt to issue regulations governing civilians without martial law is challenged in an opinion handed down in a test case by Federal Judge James A. Fee.

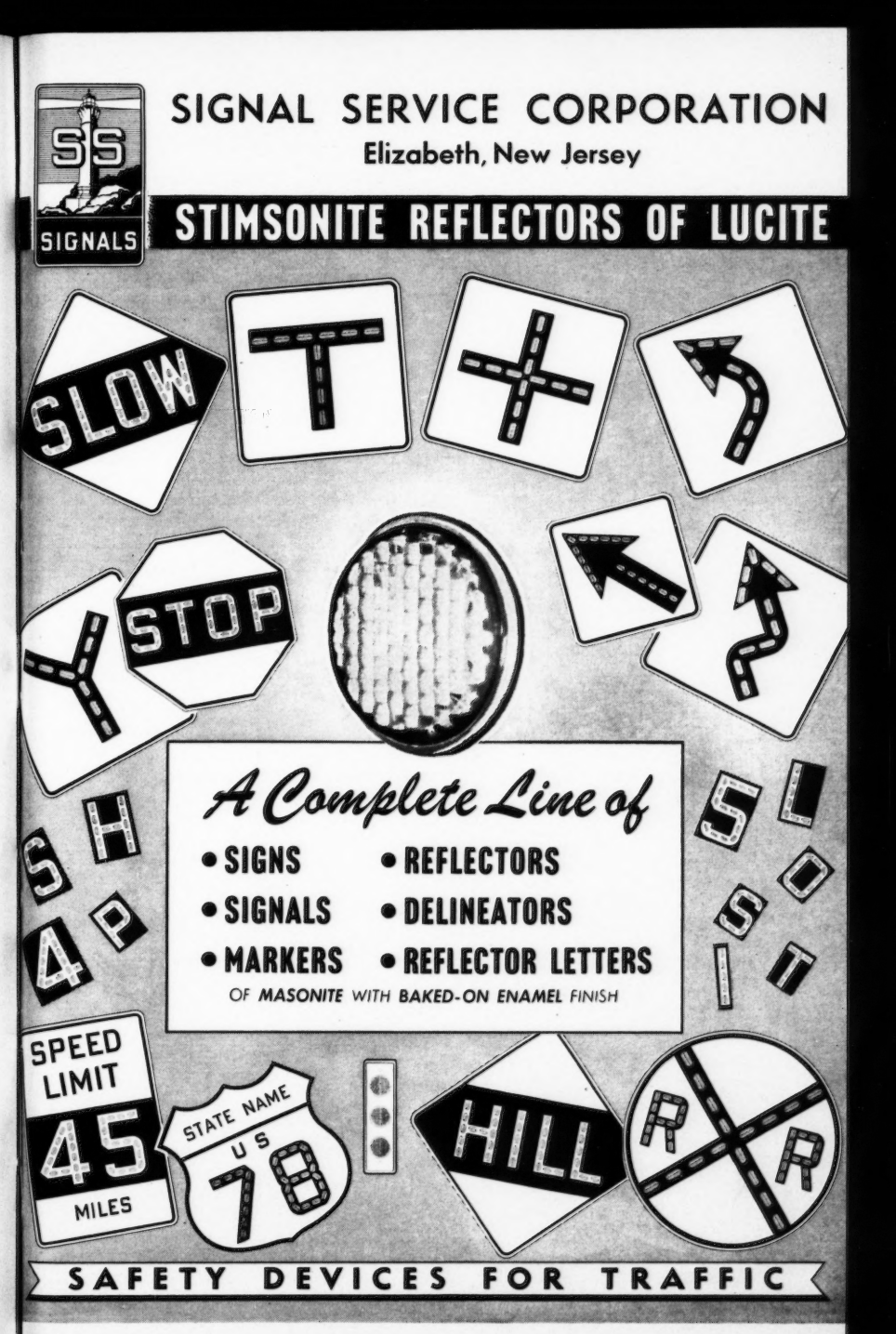
General Dewitt is head of the Western Defense Command.

Observers said the decision handed down yesterday, if upheld, might ultimately affect numerous Army proclamations, including:

The order evacuating persons of Japanese ancestry, both alien and citizen, from the coastal area; the order evacuating others termed potentially dangerous by the Wartime Civil Control Authority, and even the order for a coastal dim-out, although most cities since have passed ordinances to enforce the dim-out.

Judge Fee's decision said that while martial law is not declared, "the civil law in this country is supreme. Neither directly nor indirectly can the military power become dominant. . . . The Congress of the United States is in session and consists of the elective representatives of the people. To this body alone is committed the ordinary power of passing laws which govern the conduct of the citizens, even in time of war."

Providence *Evening Bulletin*, Nov. 17, 1942.


SS
SIGNALS
SIGNAL SERVICE CORPORATION
Elizabeth, New Jersey
STIMSONITE REFLECTORS OF LUCITE
SLOW
STOP
A Complete Line of
• SIGNS • REFLECTORS
• SIGNALS • DELINEATORS
• MARKERS • REFLECTOR LETTERS
OF MASONITE WITH BAKED-ON ENAMEL FINISH
SPEED LIMIT 45 MILES
STATE NAME US 78
HILL
R R
SAFETY DEVICES FOR TRAFFIC

MILEAGE CUT

"We have been giving 240 miles a month to motorists whether they need it or not," states Mr. Henderson, O.P.A. Chief, in announcing a cut of 15 miles of driving per week for A gasoline ration book holders in all the states having gasoline ration prior to November 22, 1942, except West Virginia which presumably will be classified with the rest of the country as a 4-gallon week state after December 1, 1942.

DO YOU KNOW

The N. Y. Public Service Commission has ordered additional protection in the form of flashing light signals, etc., at more than 600 highway grade crossings.

Iowa, Oregon and West Virginia now make 14 states with constitutional amendments against diverting highway revenues.

Private auto use in Chili is forbidden—shortages of gasoline from the United States.

New Jersey has prepared post-war plans for a 3 to 5 lane highway and parkway along the top of the Palisades.

A nation-wide survey of family needs reveals a demand for 2,100,000 automobiles in the first six months after the end of hostilities, reports *Nerba*, Vol. 12:42, October 17, 1942.

Motor carrier operators seek higher speed limit. Claim that rubber savings are negligible compared to added wear and tear on trucks.

Rubber Coordinator William M. Jeffers reports that motorists generally were "doing a good job" of observing the 35-mile-an-hour speed limit and voluntarily restricting car use, but warned that an even better one must be done.

The Office of Price Administration states that "C" gasoline ration stickers will show the purpose for which "C" rations are issued.

Safety Posters and other material on bicycle safety can be secured from the Cycle Trades of America, Chanin Bldg., N. Y. C.

Motorists in England must show that their driving is in the interests of the war effort or of the public health according to the British Press Service. For the last 18 months 99 per cent of the gasoline used in Britain has been for utility driving.

Police Chiefs' News Letter, April-May, 1942

Roadside reflector buttons placed every 100 feet along the highway have helped reduce night accidents from 20 to 25 per cent on two heavy traffic roads in Michigan, while the accident rate on comparable unprotected highways in the state mounted 5 to 16 per cent, the American Public Works Association reports.

Baltimore collected $5,000,000 last year from motor vehicle licenses, fines and gas tax and Birmingham, Alabama, has obtained $1,000,000 in gas and automobile taxes.

Grades must be reduced to 3 per cent or less, or engine power must be more than doubled, or gross vehicle weights must be reduced to approach reasonable truck speeds on grades but the most immediate relief from traffic congestion caused by slow moving vehicles on hills is possible through widening road surfaces to permit passing according to a recent Public Roads Administration report.

Parking meter installations have shown a 72 per cent increase since Jan. 1, 1940, according to the International City Managers Association. Over 347 cities now have parking meters in use.

Lord Leathers, Minister of War Transport for England, speaking before the Institute of Transport said, "On the efforts of all those who man our transport services our success depends."